NORTHEAST ELECTRONICS

A DIVISION OF NORTHERN TELECOM, INC.

INSTRUCTION MANUAL

MODEL 7015 Series

T1 REPEATER SLOT EXTENDERS

COVERS MODELS: 7015, 7015-1, 7015-2

No. 7015-00-600 ISSUE 4 DATE DEC 1975

PRINTED IN U.S.A.

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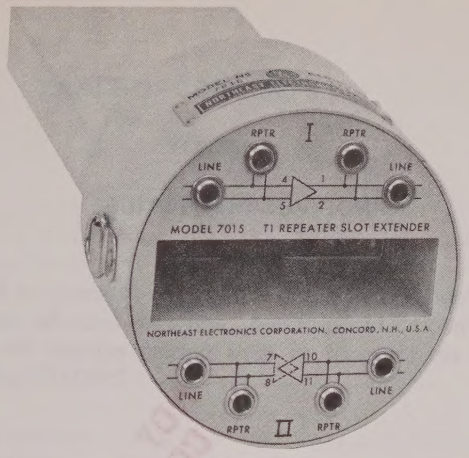
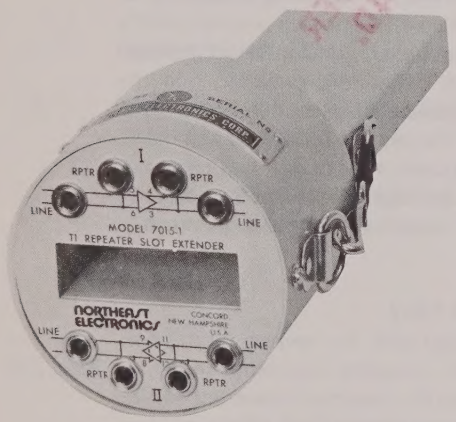


MODEL 7015



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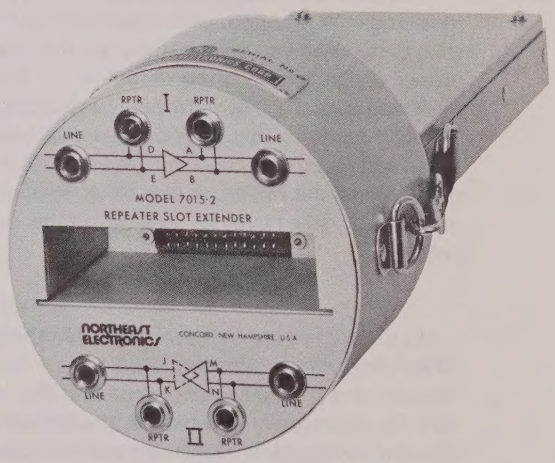

MODEL 7015-2

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TABLE OF CONTENTS

SECTION	TITLE	PAGE
1	**DESCRIPTION**	1–1
	1.1 Introduction	1–1
	1.5 Features	1–1
2	**SPECIFICATIONS**	2–1
3	**OPERATING INSTRUCTIONS**	3–1
	3.1 Introduction	3–1
	3.3 Using The Slot Extender	3–1
	3.5 Operating Procedures	3–1
	3.7 Bridging Tests	3–1
	3.8 Sectionalizing Test	3–4
	3.9 Preliminary Test	3–4
	3.10 Input Sectionalizing	3–4
	3.11 Output Sectionalizing	3–5
4	**CIRCUIT DESCRIPTION**	4–1
	4.1 Introduction	4–1
5	**MAINTENANCE**	5–1
6	**ELECTRONIC PARTS LIST**	6–1
	6.1 Introduction	6–1
7	**SCHEMATIC DIAGRAMS**	7–1
	7.1 Introduction	7–1

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
3–1	Model 7015 T1 Repeater Slot Extender, Front Panel Connectors	3–2
3–2	Models 7015 and 7005 with Repeater, Typical Interconnection View	3–2
3–3	Model 7015 Series Operational Flow Chart	3–3
7–1	Model 7015 T1 Repeater Slot Extender, Schematic Diagram	7–2
7–2	Model 7015-1 T1 Repeater Slot Extender, Schematic Diagram	7–3
7–3	Model 7015-2 T1 Repeater Slot Extender, Schematic Diagram	7–4

LIST OF TABLES

TABLE	TITLE	PAGE
6–1	Model 7015 Parts List	6–1
6–2	Model 7015-1 Parts List	6–1
6–3	Model 7015-2 Parts List	6–1

SECTION 1

DESCRIPTION

1.1 INTRODUCTION.

1.2 The Northeast Electronics Model 7015 Series of T1 Repeater Slot Extenders contains three models, each designed to match different T1 repeater equipment produced by various manufacturers. Each model in the series has:

(1) an integral probe which plugs into the repeater slot of a T1 apparatus case;

(2) an integral well which accepts a T1 repeater; and

(3) front panel jacks which give access to the electrical connections between repeater well and extender probe for either bridging or sectionalizing tests.

1.3 The probe tip connector mates with a repeater connector in a T1 apparatus case. The probe is permanently attached to a cylindrical housing which contains the well with a connector. This connector mates with a repeater itself. All wiring paths are carried through from probe tip connector to well connector.

1.4 Eight 310-type jacks on the front panel provide access to the electrical connections between probe tip connector and well connector. Transmission pairs are carried through normally closed contacts of four 310-type jacks, which permit breaking into the pairs and testing in either direction. Four other 310-type jacks provide bridging access for each transmission pair.

1.5 FEATURES.

(1) Model 7015 fits 201 and 205 type T1 repeater slots.

(2) Model 7015-1 fits WECO 208 and 209 type T1 repeater slots.

(3) Model 7015-2 fits repeater slots in T1 equipment by Vicom, Lynch, Stromberg-Carlson, ITT, and most other independent manufacturers. (These T1 repeaters have an Amphenol 133 series 12 pin connector)

(4) All models give complete access to all repeater connections without disturbing apparatus case wiring or rear protective covering.

(5) All models are completely passive and contain no delicate parts.

(6) All models have bridging jacks for monitoring signals at the inputs and outputs of both sides of a repeater.

(7) Fully enclosed wiring minimizes hazard of accidental contact with high line voltages.

SECTION 2

SPECIFICATIONS

ACCESS PROVIDED

To Repeater: Sides I and II, input and output are accessed for bridging tests via 310-type plugs.

To Line: Sides I and II, input and output are accessed for sectionalizing tests via 310-type plugs.

POWER REQUIREMENT

None

PHYSICAL CHARACTERISTICS

	Model 7015	Model 7015-1	Model 7015-2
Size: Diameter	5 in. (12.7cm)	4 in. (10.2cm)	5-1/2 in. (14cm)
Length	13-1/4 in. (33.7cm)	11-3/4 in. (30cm)	12-1/2 in. (32cm)
Weight:	3 lb. (1.36kg)	2-1/4 lb. (1.02kg)	3-1/8 lb. (1.42kg)

SECTION 3

OPERATING INSTRUCTIONS

3.1 INTRODUCTION.

3.2 Figure 3—1 shows the front panel of Model 7015. The front panel is divided into two halves. The top half is for side I of the repeater and the bottom half is for side II. The direction of side I is from left to right in both 1-cable and 2-cable systems. Side II transmission direction is from right to left in a 1-cable system and from left to right in a 2-cable system. The front panel numbers or letters (1—2, 4—5, 7—8, and 10—11 for Model 7015; 4—3, 5—6, 9—8, and 11—12 for Model 7015-1; A—B, D—E, M—N, and J—K for Model 7015-2) represent repeater pin designations. See Figures 7—1, 7—2, and 7—3. The RPTR jacks provide bridging access to the output or input of the repeater for making bridging error tests. Plugging into a LINE jack provides direct access to the line and disconnects the repeater from the line.

3.3 USING THE SLOT EXTENDER.

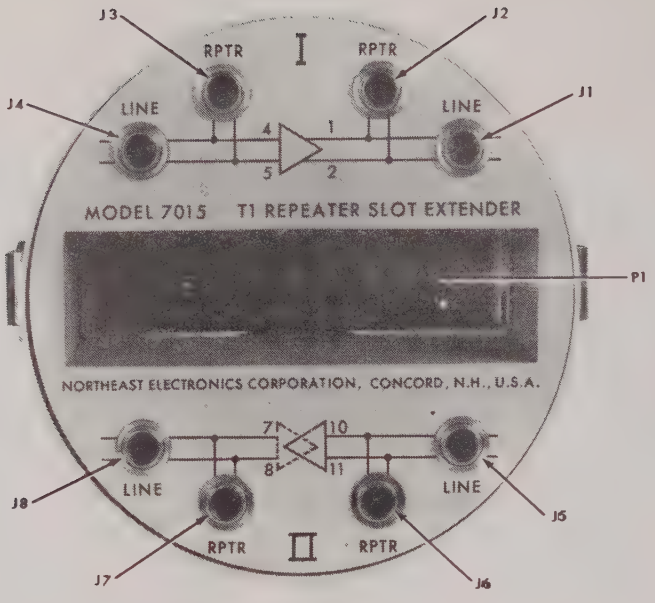
3.4 To use a slot extender for error tests, the repeater at the point of test is removed from its slot in the T1 apparatus case and the slot extender is inserted into the slot. The repeater is then inserted into the well section of the slot extender as shown in Figure 3—2. Users of the slot extender should note that installation causes a momentary disruption of service on all T1 lines associated with the repeater. Service is restored upon completion of installation. However, further momentary disruptions will occur during the sectionalizing tests described in paragraphs 3.10 and 3.11.

3.5 OPERATING PROCEDURES.

3.6 Operating procedures in the following paragraphs assume that the Model 7005 T1 Bridging Error Detector (shown on Figure 3—2) is used with the slot extender for bridging tests and sectionalizing tests. See Figure 3—3 for abbreviated operational testing procedures.

3.7 BRIDGING TESTS.

ACTION	RESULT
a. Remove service from T1 line to be tested.	
b. Remove repeater at point of test, insert Model 7015 into repeater slot and insert repeater into Model 7015 well section.	
c. The line under test is now operating.	
NOTE Service will not be disturbed during bridging tests, i.e., insertion of 310-type plugs into any of the four RPTR jacks on the Model 7015, However, service will be disrupted during sectionalizing tests, i.e., insertion of 310-type plugs into any of the four LINE jacks on the Model 7015. A simulated T1 carrier test signal is recommended for use on the T1 line while tests are being conducted so that the line is removed from service.	
d. Set LINE IN/BRDG switch on Model 7005 to BRDG position.	
e. Patch 310-to-310 cord (not more than 6 feet in length) between BRDG 310 jack on Model 7005 and output RPTR jack (for suspected side of repeater) on Model 7015.	
f. Check for pulses and errors, as described in Model 7005 Instruction Manual for bridging mode of operation.	If pulses are present and no errors are indicated, T1 signal is error-free to this point. If no pulses are present or errors are indicated, proceed to next step.



Typical For All Models

Figure 3—1. Model 7015 T1 Repeater Slot Extender, Front Panel Connectors.

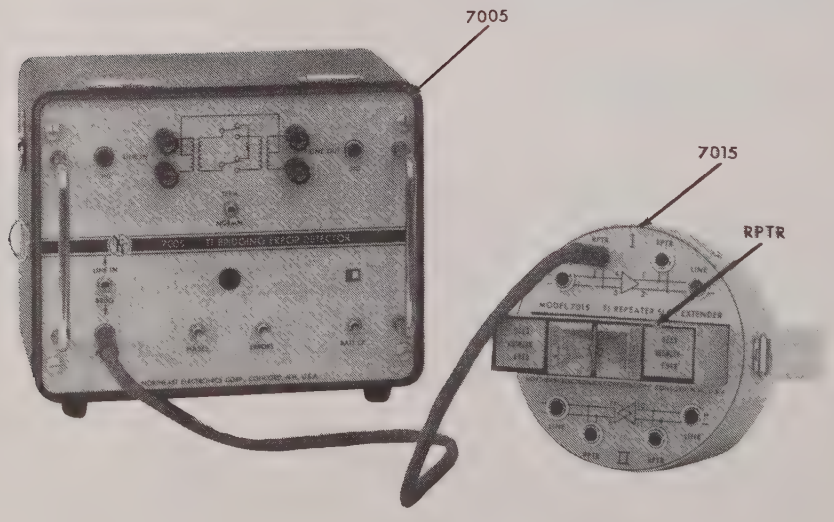


Figure 3—2. Models 7015 and 7005 with Repeater, Typical Interconnection View.

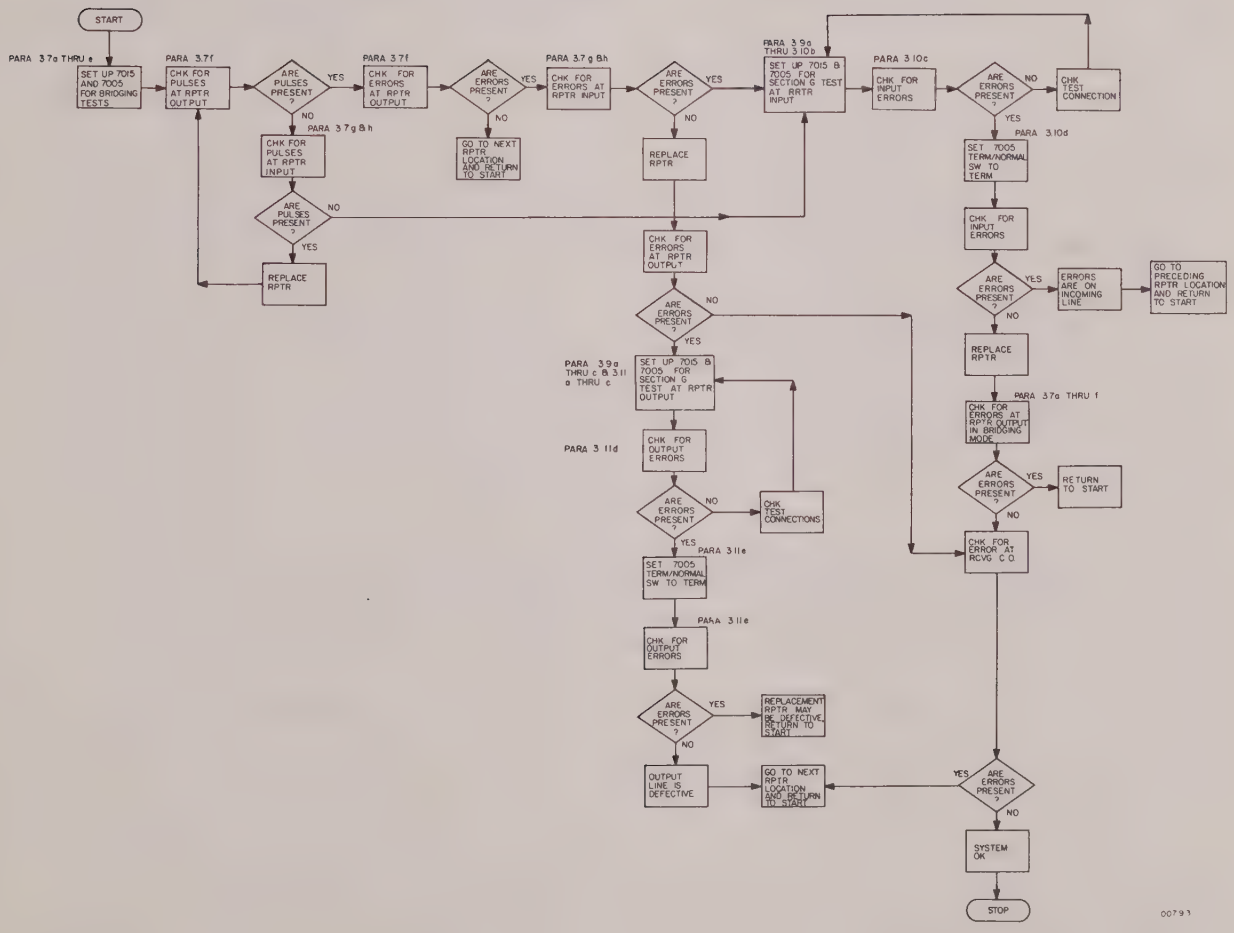


Figure 3—3. Model 7015 Series Operational Flow Chart.

ACTION	RESULT
g. Patch 310-to-310 cord (not more than 6 feet in length) between BRDG 310 jack on Model 7005 and input RPTR jack (for same side of repeater as in step e) on Model 7015.	
h. Check for pulses and errors.	If T1 signal is error-free, and errors were indicated in step f, repeater may be defective. If T1 input signal is not error-free, proceed with sectionalizing tests in paragraphs 3.8 through 3.11.

3.8 **SECTIONALIZING TESTS.**

3.9 **Preliminary Procedure.**

ACTION	RESULT
a. Remove service from T1 line being tested.	
b. Set LINE IN/BRDG switch on Model 7005 to LINE IN position.	
c. Set TERM/NORMAL switch on Model 7005 to NORMAL position.	
d. If bridging tests indicated errors at input to repeater, perform test steps in paragraph 3.10. If bridging tests indicated errors at output of repeater, perform test setps in paragraph 3.11.	

3.10 **Input Sectionalizing.**

WARNING

Perform steps a and b in the exact order as given in the procedure and avoid contact with the tips of 310 plugs while patching. A potential difference of 130 volts between a repeater LINE jack and ground may be present. Also, the specified order of patching ensures the shortest possible disruption of service.

ACTION	RESULT
a. Patch 310-to-310 cord (not more than 6 feet in length) between LINE OUT jack on Model 7005 and input RPTR jack (for side of repeater having the indicated errors) on Model 7015.	
b. Patch 310-to-310 cord (not more than 6 feet in length) between LINE IN jack on Model 7005 and input LINE jack (for same side of repeater as in step a) on Model 7015.	
c. Check for pulses and errors.	The same errors as indicated for bridging test, step h, should be indicated in this step.
d. Set TERM/NORMAL switch on Model 7005 to TERM position and check for pulses and errors.	If errors are no longer indicated, repeater may be defective. Replace repeater and repeat tests. If errors are still indicated, then there is a more obscure problem. (See paragraph 3.12.)

3.11 **Output Sectionalizing.** The **WARNING** in paragraph 3.10 for input sectionalizing applies equally to steps b and c in this procedure.

ACTION	RESULT
a. Set TERM/NORMAL switch on Model 7005 to NORMAL position.	
b. Patch 310-to-310 cord (not more than 6 feet in length) between LINE IN jack on Model 7005 and output RPTR jack (for side of repeater having indicated errors) on Model 7015.	
c. Patch 310-to-310 cord (not more than 6 feet in length) between LINE OUT jack on Model 7005 and output LINE jack (for same side of repeater as in step b) on Model 7015.	
d. Check for pulses and errors.	The same errors as indicated for bridging test, step f, should be indicated in this step.
e. Set TERM/NORMAL switch on Model 7005 to TERM position and check for pulses and errors.	If errors are no longer indicated, output line is defective. If errors are still indicated, repeater may be defective.

3.12 Wrong LBO pads, excessively short or long line lengths, impedance mismatches caused by such things as poor splices or load coils, noise on the fault locating pair, and other obscure problems can cause a repeater to produce errors. Replacing a repeater can often temporarily return a line to service. If the problem repeatedly occurs at the same location then something other than the repeater is causing the failures. Efforts should be made to find the true cause for the failures.

SECTION 4

CIRCUIT DESCRIPTION

4.1 INTRODUCTION.

4.2 All models in the 7015 Series of T1 Repeater Slot Extenders are completely passive, as shown in Figures 7—1, 7—2, and 7—3. These figures illustrate the slot extender interconnections between the T1 apparatus case and the T1 repeater. Inserting a 310-type plug into any of the four LINE jacks on the slot extender breaks into an input or output line of the repeater. The four RPTR jacks provide bridging access to the repeater's inputs and outputs. All other connections between the apparatus case and the repeater are brought directly through the repeater.

SECTION 5

MAINTENANCE

5.1 No special maintenance is required for the Model 7015 Series of T1 Repeater Slot Extenders. Reasonable care to keep connector contacts from being contaminated by foreign material is the only preventive maintenance needed. Cleaning or burnishing of connector contacts, or replacement of a connector, is the only corrective maintenance that should be required for the life of a slot extender. Use of the protective cover will prevent damage to the probe connector.

SECTION 6

ELECTRONIC PARTS LIST

6.1 INTRODUCTION.

6.2 Tables 6—1, 6—2, and 6—3 list replaceable parts for the Model 7015 Series T1 Repeater Slot Extenders.

Table 6—1. Model 7015 Parts List.

REF DESIG	DESCRIPTION	MFGR	MFGR P/N	NORTHEAST P/N
J1,4,5,8	Telephone Jack	SWCRFT	5J-1594	650403200
J2,3,6,7	Telephone Jack	SWCRFT	5J-1583	650403100
J9	Female Contact Pin			A700200036
	Bottom Conn Assy			A700200123
	Top Conn Assy			A700200135
P1	11-Pin Male	GTE LENKURT	041-48973-01	653500100
	Protective Cover			C7015-00112

Table 6—2. Model 7015-1 Parts List.

REF DESIG	DESCRIPTION	MFGR	MFGR P/N	NORTHEAST P/N
J1,4,5,8	Telephone Jack	SWCRFT	5J-1594	650403200
J2,3,6,7	Telephone Jack	SWCRFT	5J-1583	650403100
J9	Card Edge Connector	LYNCH CMM	5935-0042	653500300
P1	Probe Interconnection			970096613
	Protective Housing			C701501111

Table 6—3. Model 7015-2 Parts List.

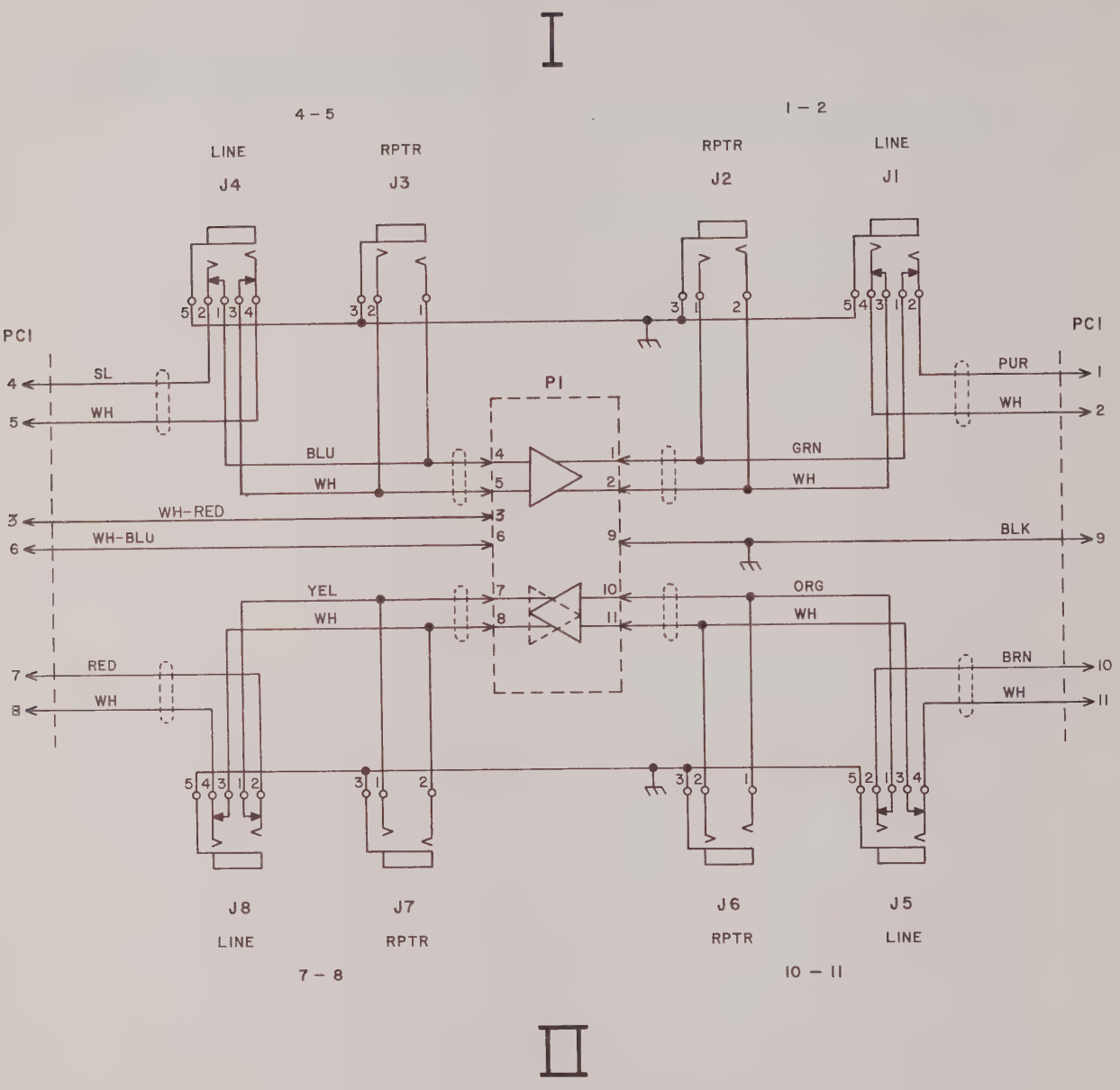
REF DESIG	DESCRIPTION	MFGR	MFGR P/N	NORTHEAST P/N
J1,4,5,8	Telephone Jack	SWCRFT	5J-1594	650403200
J2,3,6,7	Telephone Jack	SWCRFT	5J-1583	650403100
J9	12 Pin Panel Plug	AMPHENOL	133-012-21	651702100
P1	12 Pin Panel Recept	AMPHENOL	143-012-01	651702000
	Protective Cover			C701502110

SECTION 7

SCHEMATIC DIAGRAMS

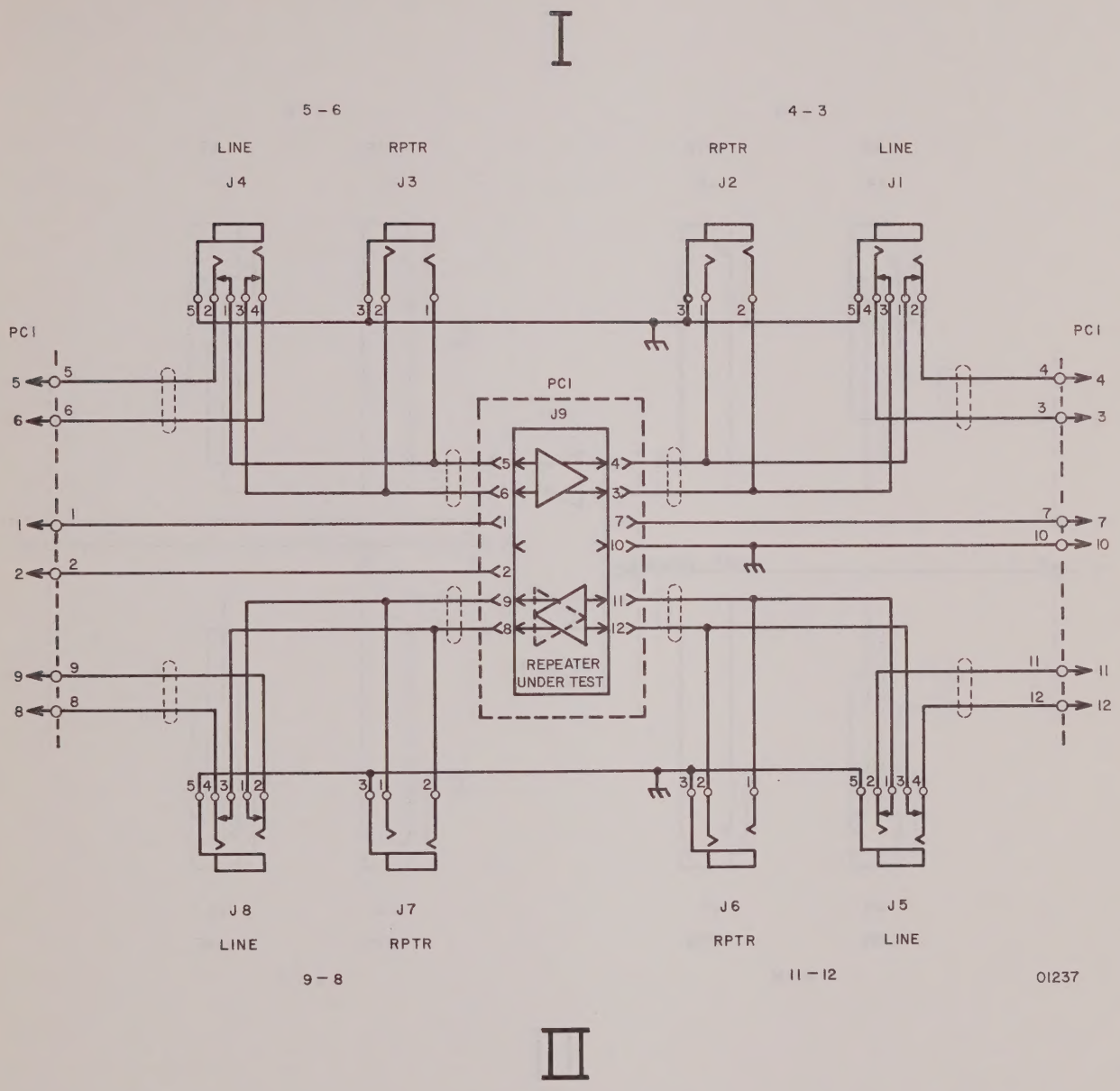
7.1 INTRODUCTION.

7.2 Figures 7—1, 7—2, and 7—3 show the circuits within each Model 7015 Series T1 Repeater Slot Extender. These figures also illustrate the interconnections between the Model 7015 and a repeater under test.



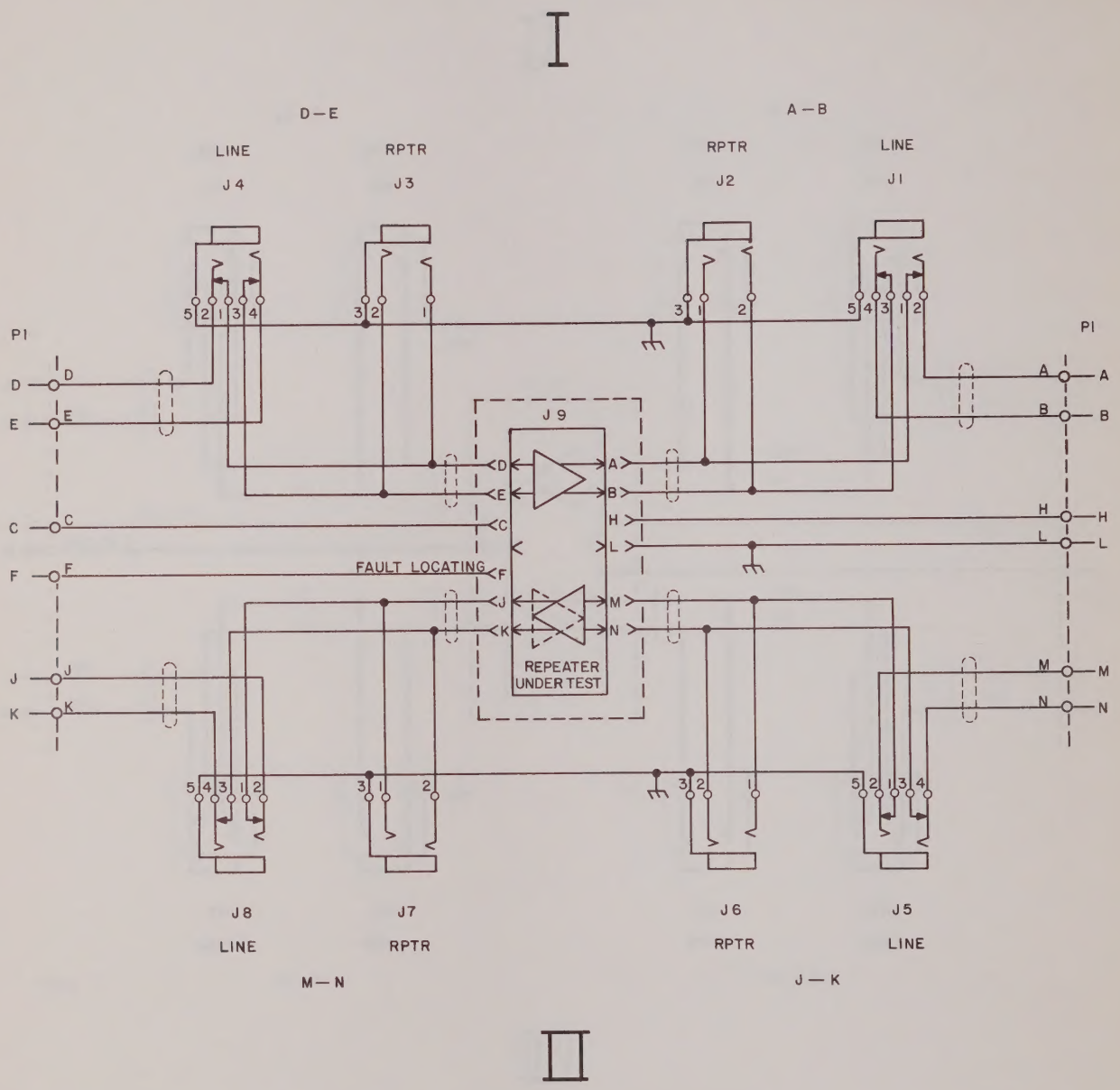
ELECTRICAL NOTES:
1- ⋯⋯ INDICATES TWISTED PAIR.

Figure 7—1. Model 7015 T1 Repeater Slot Extender, Schematic Diagram.



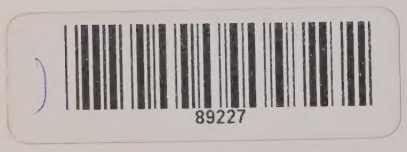
ELECTRICAL NOTES:
1 – ⊏⊐⊐⊐ INDICATES TWISTED PAIR.

Figure 7—2. Model 7015-1 T1 Repeater Slot Extender, Schematic Diagram.



ELECTRICAL NOTES:
1- (---) INDICATES TWISTED PAIR

Figure 7—3. Model 7015-2 T1 Repeater Slot Extender, Schematic Diagram.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